

29937 - Waste Management and Environmental Impact

Syllabus Information

Academic Year: 2019/20

Subject: 29937 - Waste Management and Environmental Impact

Faculty / School: 110 - Escuela de Ingeniería y Arquitectura

Degree: 435 - Bachelor's Degree in Chemical Engineering

ECTS: 6.0

Year: 4

Semester: Second semester

Subject Type: Optional

Module: ---

1.General information

1.1.Aims of the course

1.2.Context and importance of this course in the degree

1.3.Recommendations to take this course

2.Learning goals

2.1.Competences

2.2.Learning goals

2.3.Importance of learning goals

3.Assessment (1st and 2nd call)

3.1.Assessment tasks (description of tasks, marking system and assessment criteria)

4.Methodology, learning tasks, syllabus and resources

4.1.Methodological overview

This subject includes theory and practice and its learning process is based on 2.4 ECTS of work done in-person (60 hours), and 3.6 ECTS (90 hours) of self-guided study and work group. The programmed activities are detailed below.

The class presentations, work group and laboratory instructions are available for the students at the subject website (Moodle platform) that can be found at <http://moodle2.unizar.es/add/>.

4.2.Learning tasks

On-site activities: 2.4 ECTS, 60 hours

1. Classroom based sessions (TP1): 30 hours, 2 per week. Sessions with theoretical and practical contents. The units are presented encouraging class participation, reflexive and proactive attitudes.
2. Problem solving and case studies (TP2): 15 hours, 1 per week. Exercises and case studies will be done in order to complement theoretical sessions. The student should work on the preparation of these case studies previously, and participate in class.
3. Laboratory and simulation sessions (TP3): 10 hours divided in 5 sessions of 2 hours each. The student will develop practical skills related to waste management, either based on simulation software or in laboratory work. The student should read the instructions for each sessions previously and be able to hand in the required report at the end of each session.

4. Evaluation (TP8): 5 hours. Besides obtaining a mark, evaluation is one of steps of the learning process, where the students can check their degree of understanding of the presented concepts and their acquirement of the required competencies.

If possible, some visits to waste management facilities will be planned during the semester. These visits are voluntary for the students. Attendance will account for approximately 5 hours of non on-site activities.

Non on-site activities: 3.6 ECTS, 90 horas.

1. Study (TP7): 40 hours. Includes study and problem solving. Continuous work by the student will be encouraged. Tutorials are also included in this section.
2. Work group (TP6): 50 hours. Includes the development of different subject in groups of 2-3 persons.

4.3.Syllabus

The course will address the following topics:

Module 1. Waste management

Unit 1.1. Introduction, General concepts

Unit 1.2. Urban waste management.

Unit 1.3. Industrial wastes management.

Unit 1.4. Management of sewage sludge from Waste Water Treatment Plant (WWTP).

Unit 1.5. Management packaging wastes.

Unit 1.6. Management of other waste: WEEE (Waste Electrical and Electronic Equipment), Out of use vehicles, Sanitary, etc.

Module 2. Environmental impact assessment (EIA)

Unit 2.1. Introduction to Environmental Impact Assesment.

Unit 2.2. Impact Assesment. Concept and features.

Unit 2.3. The administrative procedure of environmental impact assessment

Unit 2.4. The environmental impact study.

Laboratory sessions:

- Lab session nº 1. Design and control of an aerobic composting process (I).
- Lab session nº 2. Management of industrial wastes (I).
- Lab session nº 3. Management of industrial wastes (II).
- Lab session nº 4. Thermal treatments of sewage sludge from WWTP.
- Lab session nº 5. Design and control of an aerobic composting process of urban wastes (II).

4.4.Course planning and calendar

Planning (summary):

- Classroom-based sessions (TP1). 30 hours total (2 per week)
- Problem-solving and case studies (TP2). 15 hours total (1 per week)
- Laboratory and computer sessions (TP3). 10 hours total (5 sessions, 2 hours each)
- Evaluation (TP8): 5 hours total.
- Home study (TP7): 40 hours estimated.
- Workgroup (TP6): 50 hours estimated.

4.5.Bibliography and recommended resources

http://biblos.unizar.es/br/br_citas.php?codigo=29937&year=2019